MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2017/2018

TCP3151 – INTEGRATIVE PROGRAMMING AND TECHNOLOGIES

(All sections / Groups)

4 JUNE 2018
9.00AM – 11.00AM
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 6 pages excluding the cover page.
2. Attempt all FIVE questions.
3. All questions carry equal marks and the distribution of the marks for each question is given.
4. Please write your answers in the Answer Booklet provided.

QUESTION 1 (10 MARKS)

a) A native mobile app is a smartphone application that has been developed for use on a particular platform or device. Briefly discuss the features of native mobile app and list **TWO** (2) programming languages that involved in the development of native mobile app.

(4 marks)

b) Distributed system is a collection of independent computers that appear to the users of the system as a single system. Describe **TWO** (2) distributed systems architectures that are used in the distributed system.

(4 marks)

c) Both Common Object Request Broker Architecture (CORBA) and Component Object Model (COM) are middleware technology that allows application programs to communicate with one another. Identify **TWO** (2) differences between CORBA and COM.

(2 marks)

Continued...

QUESTION 2 (10 MARKS)

a) In order to develop an application, a developer will mostly need to have knowledge of programming languages and scripting languages. State **FOUR** (4) differences between programming languages and scripting languages.

(4 marks)

b) Three-tier architecture is designed and optimized for the deployment of web-based and business information applications. Draw a diagram to show the model of three-tier architecture.

(2 marks)

c) You are a software manager in a sports equipment company. For company to stay competitive, your boss plans to expand the business activities to other states. Middleware is needed to build an operating distributed environment that can handle the transactions across several database systems from other states. You are required by your boss to list the type of middleware and suggest the most suitable middleware for the company.

(4 marks)

Continued...

QUESTION 3 (10 MARKS)

a) You are required to write a well-formed XML document based on the information given below.

"Mr. Peter Lorre is a marketing manager with staff id of 1622. He starts his work on 1 June 2018 with monthly salary of USD2000".

You are freely to name the tag element where the name of the tag element must follow the standard naming rule.

(4 marks)

b) A news group has:

- The name of the news group is root element.
- It has two sub elements: moderator and a list of articles.
- Moderator consists of attribute of email address
- A list of articles, each article has a sender, a subject, and contents.

Write a suitable DTD in defining the news group based on the above format.

(4 marks)

c) When will the entity reference to be used in XML document? Write **TWO** (2) examples of entity references that are used in XML document.

(2 marks)

Continued...

QUESTION 4 (10 MARKS)

a) XML provides flexibility in storing data and the data is able to be transformed to several types of format. In view of this, you are requested by your team leader to display the content of XML in a table form. Construct the table that matches with the data in the XML document below.

```
<?xml version="1.0" encoding="UTF-8"?>
<album code = "1198023">
  <title>The Sound of Music</title>
  <singer>Julie Andrews</singer>
  <release year="1965" month="3" date="2" />
  <price currency="USD">40<</price>
</album>
```

(4 marks)

b) How does XSLT works in XML document? Draw a diagram to illustrate the process.
(4 marks)

c) How to know an XML document is valid?
(2 marks)

Continued...

QUESTION 5 (10 MARKS)

a) Java Native Interface (JNI) enables Java code and native code (C/C++) to be collaborated and shared resources. Give **THREE** (3) drawbacks of JNI that limit its usage.

(3 marks)

b) Write the output based on the two given codes (Test.java and CTest.c) below.

```
// Test.java
class Test{
   private native int call();
   private void callback(){
         System.out.println("Calling from Java");
   }
   private int callnum(){ return 123; }

   public static void main (String args[]){
      Test p = new Test();
      System.out.println("The value is " + p.call());
   }
   static { System.loadLibrary("CTest"); }
}
```

```
// CTest.c
#include <jni.h>
#include <stdio.h>

JNIEXPORT jint JNICALL Java_Test_call (JNIEnv *env, jobject obj){

   jclass cls = (*env)->GetObjectClass(env, obj);
   jmethodID mid1 = (*env)->GetMethodID(env, cls, "callback", "()V");
   jmethodID mid2 = (*env)->GetMethodID(env, cls, "callnum", "()I");

   if ((mid1 == NULL ) || (mid2 == NULL))    return 0;
   printf("Calling from native code\n");

   (*env)->CallVoidMethod(env, obj, mid1);
   jint kk = (*env)->CallIntMethod(env, obj, mid2);
   return kk;
}
```

(3 marks)

Continued...

c) The CTest.c from Q5(b) utilises the instance method to access the function callback() and callnum(). If both the function callback() and callnum() are changed to static methods, rewrite the code of CTest.c to reflect the changes. Underline the changes that you have made.

(4 marks)

End of Paper